PRL-TR-67-1

March 1967

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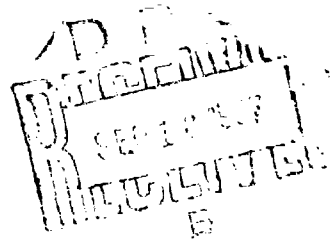
By

Raymond E. Christal



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AIR FORCE SYSTEMS COMMAND
Lackland Air Force Base, Texas

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FOREWORD

The policy-capturing model developed by the Personnel Research Laboratory has been described in previous papers (Ward & Davis, 1963: Christal, 1963, 1965). However, a fable used in a presentation to the 13th Annual Air Force Science and Engineering Symposium (Christal, 1966) was found to provide a relatively "painless-to-take" description of the model which communicated effectively to a wide audience. For this reason, it is now published (modified and expanded) in the Laboratory's Technical Report series. Readers desiring more details concerning the Policy-Capturing Model and its application should refer to Bottenberg and Ward (1963), Bottenberg and Christal (1961), Christal (1963, 1965), and Ward and Davis (1963).

This research was completed under Project 7734, Development of Methods for Describing, Evaluating, and Structuring Air Force Occupations; Task 773402, Development and Appraisal of Methods for Job Evaluation; and Project 7719, Development of Procedures for Increasing the Efficiency of Selection, Evaluation, and Utilization of Air Force Personnel; Task 771901, Mathematical and Statistical Techniques to Facilitate Research on the Utilization of Air Force Personnel.

This report has been reviewed and is approved.

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ABSTRACT

This paper describes how a mathematical equation, derived with the fixed-X multiple linear regression model, can be used to define and implement the policy of an individual or rating board. The model, which has been discussed in previous papers, is described in easy-to-follow, non-technical language. Several applications of the model are presented.

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SELECTING A HAREM—AND OTHER APPLICATIONS OF THE POLICY-CAPTURING MODEL

I. A SHORT FABLE

Once upon a time, there was an Oriental king who was concerned as to how he might make a name for himself in history. "I know," he said, "I'll select a harem larger than King Solomon's."

So the word went out, and soon thousands of young girls were arriving from the various provinces to seek the king's approval.

Early one morning the king began his selection process. As each girl filed by, he looked her over carefully and then expressed his judgment.

"Excellent!" he would say. "This one is very pleasing to my eye." Or perhaps he would hum and haw with indecision. Many times he would show his disapproval in no uncertain terms. "Never!" he would say. "Pass on! Pass on!"

In each instance, the Court Recorder attempted to quantify the king's degree of approval by checking the appropriate level on a 9-point scale which had been devised especially for the occasion by the Chief of the Royal Psychometricians.

By suppertime the king had considered some 300 girls. His eyes and his imagination were beginning to tire.

"Most High First Counselor," he said, "you've been watching me all day, and by now you should know my likes and my dislikes. I've decided to leave the selection of my harem in your hands. But take care! If your choices do not please me, it will be your head!"

After the king retired, the Most High First Couselor summoned the Chief of the Royal Psychometricians. "I'm passing the job on to you," he said. "If you fail to please the king, your head will roll along with mine."

The Chief of the Royal Psychometricians called his staff together and explained the situation.

"We must not fail," he said, "or it will be all of our heads."

"How shall we proceed?" asked one of the young staff members who was fresh out of the Royal Academy.

"Well," responded the Chief, "we know how the king rated the first 300 girls. Right?"

"Right!"

"And we can see everything the king saw when he looked at the girls. Right?"

"Right!"

"Then all we have to do is to uncover the girly characteristics considered by the king and determine how he weighted them in his judgment. This is a natural for the Multiple Linear Regression Model." (See Bottenberg & Ward, 1963)

"But how do we know which characteristics he considered?" asked the neophyte.

"We don't, you fool! Didn't they teach you anything in that school? That's what the regression model is for. If a girly characteristic adds to our ability to predict the king's ratings, we may assume he gave it consideration. Now let's get on with the business."

"How about height?" asked one of the staff members. "Does the king like short girls or tall girls?"

"Neither," replied another. "I would guess that the relationship between height and the king's preference is curvilinear. Some girls are too tall, while others are too short."

"Well," responded the neophyte, "if the relationship is curvilinear, then we cannot use the linear regression model. If we were to plot the curve between height and acceptability, I think we would find it to be parabolic."

"They really didn't teach you very much in that school, did they?" commented the Chief. "What is the general equation for a parabola?"

"$aX^2 + bX + c$," responded the neophyte.

"Bravo!" declared the Chief. "Now let X be a vector of heights. If we square each value in the height vector, we generate a new vector X^2. Now if we introduce these two predictors in the regression model, what will be the form of the resulting equation?"

"$aX^2 + bX$ plus the regression constant c," replied the young man.

"Simple, isn't it?" responded the Chief. "You see, there's no problem in fitting curvilinear relationships with the linear regression model as long as the proper power terms are introduced as predictors. The linear restriction is on the weighting system, not on the form of the predictors." (See Figure 1)

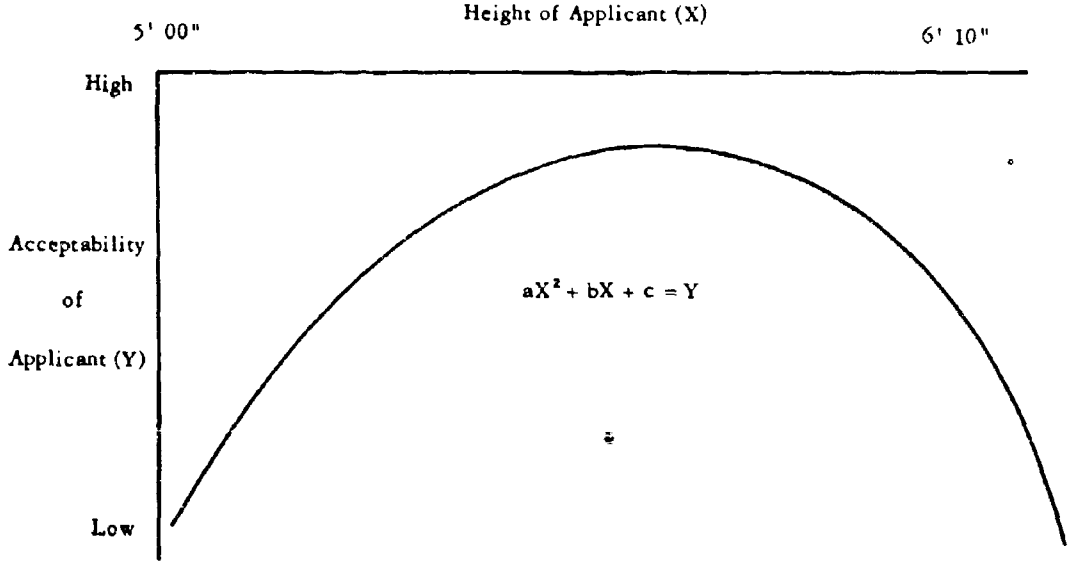

Fig. 1. **Relationship between applicant height and judged acceptability.**

"How about eye color?" asked one of the other staff members who was eager to move on. "I'm sure the king looked at the color of each girl's eyes."

"Fine," said the Chief, "we will consider eye color in our equations. Since eye color is not an ordered variable, we must introduce a separate categorically coded predictor for each color."

"What the Chief means," whispered one of the staff members to the neophyte, "is that for a variable associated with a particular eye color, each girl will be assigned a value of 1 if her eyes are that color and a value of 0 if her eyes are not that color."

"It's been my observation," said one of the group, addressing the Chief, "that the king likes blue eyes on blondes, but not on brunettes."

"That's easily handled," responded the Chief. "First we will introduce categorical predictors for each hair color; then we can cross-multiply eye-color and hair-color variables in order to generate the appropriate interaction predictors." (See Table 1)

"I thought," said one of the group, "that the regression model assumes the predictors to be normally distributed, and also that their joint-distribution is normal. We certainly can't meet meet these assumptions using powered terms, interaction terms, and categorically coded predictors."

"You're right," said the Chief, "if you're talking about the multi-normal model. But we're going to use the fixed-X model, which does not involve these assumptions. We would be stupid to restrict ourselves to normally distributed predictors. It would force us to omit most of the variables which we know the king considered."

"But," objected the staff member, "if we use the fixed-X model, we cannot generalize beyond the computing sample."

"Who can't?" responded the Chief. "Let's not assume our equation will fail to hold up just because our predictors are not normally distributed."

"Well, I'm from Outer Missourivich," said the staff member.

"Very well," replied the Chief, "if it will make you feel better, we will develop our equation on the first 150 girls rated by the king, and then check how well the equation predicts his judgments of the remaining 150 girls."

And so went the conference into the wee hours of the morning. Over a hundred predictors were eventually defined, each representing a girly characteristic which might have influenced the king's judgments. The time has now come for the acid test. Could they produce an equation which would simulate the king?

Table 1. **Examples of Categorically Coded and Interaction Predictors**

	Predictor Vectors						
Applicant Number	X_1 Blue Eyes	X_2 Brown Eyes	X_3 Brown Hair	X_4 Blonde Hair	X_5 (X_1 X_3)	X_6 (X_1 X_4)	X_7 (X_2 X_3)
1	1	0	1	0	1	0	0
2	0	1	1	0	0	0	1
3	0	1	1	0	0	0	1
4	1	0	0	1	0	1	0
5	0	1	0	1	0	0	0
6	1	0	0	1	0	1	0
.	.	.	.	.	.	.	.
.	.	.	.	.	.	.	.
.	.	.	.	.	.	.	.
N	1	0	1	0	1	0	0

Some of the royal guards had to be called in to help measure and evaluate each girl on the predictor variables. It was a madhouse with 20 guards checking eye colors, weighing and measuring the 300 girls.

By late afternoon, the raw data had been accumulated. All that night and throughout the next day and night, one could hear the constant clicking of the abaci beads coming from the royal computing shop. Then came the answer:

"We got an R^2 of .87, and it held up in the cross-application sample," reported a messenger to the Chief of the Royal Psychometricians, who was with his staff in the coffee room anxiously awaiting the results.

"Hmm," said the Chief, "that's pretty good. But it's not good enough for me to risk my head on it. There must be some variable we failed to consider."

"Maybe the king likes girls who look like his mother," offered the neophyte. "Men often do."

"You're a genius," said the Chief. "It's certainly worth a try."

"How can we quantify that?" asked a staff member. "You can't measure it with a yardstick."

"We'll establish a rating board," responded the Chief. "Each board member will judge how much each girl looks like the king's mother. We will use an average of their ratings for each girl as our new predictor."

When the new variable was introduced into the king's policy equation, the R^2 jumped to .94. Everyone now felt confident that they had an equation which would truly simulate the king. The rest was routine. By the end of the week, all of the 8,000 girls in the applicant pool had been evaluated by the final policy equation, and those with the highest composite scores were selected.

The king was very pleased with the results, and as a reward, he gave the Most High First Counselor and the Chief of the Royal Psychometricians their choice of the leftovers.

II. APPLICATIONS OF THE POLICY-CAPTURING MODEL

Capturing the Policy of a Board

The preceding fable describes capturing the policy of a single judge. However, if there is high interrater agreement among members of a policy board, then mean values can be used as the criterion vector to represent the entire board. If interrater agreement is low, it may be that the raters can be divided into two or more groups within each of which there is high agreement. This can be accomplished through application of a hierarchical grouping technique which clusters judges in terms of the homogeneity of their prediction equations (Christal, 1963; Bottenberg & Christal, 1961). Thus, if more than one policy exists among board members, each such policy can be identified and described. Differences in policies are thereby pinpointed for arbitration.

A Few Previous Applications of the Model

The policy-capturing model has been applied in many studies conducted by the Personnel Research Laboratory. Equations developed thusfar have been highly valid and have held up on cross-application. For example, equations have been developed to simulate officer promotion boards. These equations will predict with a high degree of accuracy the ratings a board will give to officers under consideration. Recently, equations were developed to simulate the actions of career counselors in making the initial assignments of airmen graduating from basic training. These equations are now being used in an operational computer-assisted assignment system.

One study was conducted to determine the relative importance of certain variables in accounting for the proficiency of airmen working in particular career ladders (Naylor & Wherry, 1964).[1] This could have been accomplished by having supervisors rate the proficiency of incumbents who, in turn, had been measured on the variables under consideration. The main expense in such an approach, however, is associated with the collection of predictor information, which would involve the administration of tests and the collection of ratings on hundreds of workers at dozens of Air Force bases. Instead of using data collected on real-live people, therefore, samples were "created" by ascribing scores to simulated workers. It can be demonstrated that exactly the same equations will be obtained using simulated cases as will be obtained using real subjects, provided two conditions are met. First, every case generated must be conceivable to the judge. That is, a case may not be described as being 18 years old and having 25 years of education. Second, the scores must be ascribed in a manner which assures reasonable variance for each predictor. In this particular study, several samples of 250 simulated cases each were developed, and not one of the judges realized that he was rating artificial incumbents. Furthermore, many of the obtained policy equations correlated above .90 with ratings obtained from these judges. Similar results have been obtained in other studies using simulated stimuli (Madden, 1963; Madden & Giorgia, 1965).

The Officer Grade Requirements Project

The Officer Grade Requirements (OGR) Project is probably the largest effort on record involving the capturing and implementation of policy in an operational setting (Christal, September 1965). The Director of Air Force Manpower and Organization asked the Personnel Research Laboratory if it could conduct a study to determine the appropriate distribution of grades for jobs in various officer specialties and utilization fields. We said, "Fine—if you will make a policy decision concerning the appropriate grade levels for a sample of jobs which we will select, then we will provide you with a system to determine the appropriate grade levels for the rest of the jobs in the Air Force."

The agreement was made, and as a first step comprehensive job descriptions were collected from 85,000 officers. A sample of 3,575 descriptions representing jobs at all levels in all specialties was selected from this file. Then a policy board composed of 22 colonels was called by Headquarters USAF to determine the appropriate grades for jobs in the sample.

Collection of Ratings from the Policy Board. Using a 16-point scale, five members of the board provided independent grade ratings for each of the 3,575 jobs. The scale provided for three levels within each grade. That is, the rater had to indicate whether a job is most appropriately filled by a senior colonel, a colonel with average time in grade, or a junior colonel. Board members had access to any information needed about the nature of a job being rated. First, they had the job description. If they needed more information, they could consult the members of a panel identified as being knowledgeable in the relevant career area. If that was not enough, they could call special air staff consultants available at Headquarters USAF. Finally, if necessary, they could telephone the supervisor of the incumbent in the job being rated.

Ratings were independent. Board members were not allowed to have knowledge of the current Unit Manning Document grade authorization for the job. They were not informed of the grade held by the incumbent or by his supervisor. Members were not permitted to question other board members or consultants concerning the appropriate grade for the job being rated.

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[1] This study was conducted under contract with the Ohio State University and was monitored for the Personnel Research Laboratory by Dr. Llewellyn Wiley.

Analysis of Board Ratings. Since ratings provided by the policy board were to be used for establishing Air Force grade requirements, it was important to demonstrate that these ratings were stable; that there was high agreement among board members concerning grade requirements for particular jobs; that the raters had confidence in their ratings; and that the raters were not biased for or against jobs in various specialties or commands. A series of analyses of the policy board ratings was accomplished to evaluate the quality of their ratings.

Results from these analyses were encouraging. First, the interrater agreement was correlated at .92, which was considered acceptable for the proposed application. Second, the raters expressed a high level of confidence in their grade ratings of the 3,575 jobs in the criterion sample. For 2,387 of the jobs, at least four of the five raters expressed the highest level of confidence in their judgments. Only 59 jobs had an associated confidence level of less than 2.00 on a 3-point scale. Finally, analyses indicated that board members were not simply giving back the grade levels currently authorized for jobs; and that they did not recommend a wholesale across-the-board increase in grade.

Table 2 shows summary results of an analysis designed to identify raters exhibiting a bias for or against jobs in a particular command or occupational grouping. The values in the table are the differences between the average of ratings assigned by a rater on the 16-point scale to jobs in a particular category and the average of ratings assigned by all raters. Since three points on the 16-point scale represent one grade level, a value of 3.0 in the table would indicate that a board member rated jobs in a given category approximately one grade higher than other board members. Similarly, a value of -3.0 would indicate judgments averaging one grade lower than those of other members. The highest reported value is 1.7, and most of the values are less than 1.0. The largest values tend to be associated with judges who rated all categories somewhat high or low, and these judges did not show a bias toward jobs in particular categories.

Development of a Policy Equation. Once the policy board's grade ratings for jobs in the criterion sample had been accepted, attention was directed toward development of a policy equation. This turned out to be a challenging bit of detective work because no information was available to indicate the factors considered by board members in making their decisions about grade requirements. During an eight-month period, nearly 200 variables which might have influenced the board's judgments were hypothesized and evaluated. Slowly but surely, after computation of several hundred equations, a relatively simple 9-predictor system evolved which adequately expressed the board's policy. Every one of these predictors had high face validity for grade; and when properly weighted together, they produced a job evaluation composite which had a correlation of .92 with the judgments of the board in the 3,575 case sample.

Table 3 describes the variables in the final equation. The first five variables are job evaluation factors rated by lieutenant colonels and majors in the field and may be considered the primary definers of officer grades. According to the policy equation, the grade of an officer job is determined first by the complexity, variety, and level of activities managed; second, by the scope and significance of work for which planning is done; third, by the requirements for special training courses and on-the-job experience; fourth, by the importance and independence of judgments and decisions required by the job; and fifth, by the level of agencies and individuals with which or with whom the incumbent must communicate. It is also noted that the organizational level of the job and level of the job within this organization help to determine the appropriate grade level. It was found that supervisors' judgments concerning the appropriate grade level for jobs tended to be inflated. However, since the equation automatically adjusted supervisory ratings to bring them into line with the policy board's recommendation, this variable was found useful for inclusion in the equation.

Table 2. Average Deviation of Each Board Member's Ratings by Job Category[b]

Job Category[a]	Rater Number																					
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
All jobs	-0.4	0.9	-0.0	1.2	0.2	-0.2	-1.0	0.2	-0.5	0.6	1.0	-0.5	-0.2	-0.4	-0.4	0.3	0.4	-0.2	0.2	-0.1	-0.8	-0.2
SAC	-0.7	1.4	-0.2	1.1	0.2	0.2	-1.0	0.1	-0.2	1.7	0.9	-1.0	-0.1	-0.8	-0.7	0.3	0.1	-0.4	0.2	-0.2	-0.9	-0.3
TAC	-0.2	1.0	-0.1	1.4	0.6	-0.2	-1.1	0.1	-0.7	0.4	1.3	-0.8	-0.3	-0.7	-0.1	0.4	0.2	-0.2	0.6	-0.4	-1.0	0.1
PACAF, USAFE, USAFSS	-0.2	0.8	-0.2	1.3	0.1	-0.2	-0.8	0.4	-0.9	0.7	1.0	-0.8	-0.4	-0.3	-0.1	0.2	0.1	-0.1	0.2	-0.1	-0.6	-0.0
Hq Comd, Hq USAF	-0.4	0.8	0.3	0.8	-0.3	-0.3	-1.0	-0.2	-0.3	-0.1	0.7	0.1	-0.2	0.1	0.1	0.2	0.9	0.2	-0.5	-0.1	-0.4	-0.3
AFSC, OAR	-0.2	0.5	0.8	1.3	-0.1	-0.8	-1.4	0.1	-1.1	-0.2	1.1	0.8	-0.5	0.0	-0.5	0.2	1.5	-0.3	-0.0	-0.1	-0.6	-0.6
AFLC, AFAFC, AFCS	-0.3	0.2	-0.3	1.1	-0.1	-0.6	-0.7	0.5	-0.5	-0.1	0.9	-0.1	-0.0	-0.3	-0.5	0.3	0.8	-0.3	-0.1	-0.2	-0.3	0.5
AAC, SOU, ADC, CONAC	-0.1	0.8	-0.4	1.4	0.0	-0.1	-0.7	0.5	-0.7	0.5	0.9	-0.8	-0.3	-0.4	-0.2	0.1	0.4	-0.2	-0.0	-0.0	-0.7	-0.1
ATC, AU, USAFA	-0.4	0.6	-0.4	1.4	0.6	-0.6	-0.9	0.2	-0.7	-0.5	1.0	-0.1	-0.1	-0.7	-0.4	0.4	0.1	0.1	0.8	0.5	-0.8	-0.1
Other Commands	-0.4	0.9	0.2	1.2	0.3	0.1	-1.0	0.5	-0.3	0.4	1.0	-0.7	-0.4	-0.3	-0.4	0.4	0.5	-0.2	-0.1	-0.5	-1.3	-0.1
Pilot and Navigator	-0.4	1.7	-0.2	1.2	0.6	-0.3	-1.2	0.4	-0.4	1.0	1.3	-0.6	-0.3	-0.7	-0.3	0.7	-0.1	-0.1	-0.5	-0.6	-1.3	-0.2
Air Operations	-0.8	0.6	0.0	1.1	-0.3	0.4	-0.9	0.2	-0.3	1.6	1.0	-0.8	-0.3	-0.2	-0.3	-0.0	0.3	-0.3	-0.0	-0.5	-0.7	0.1
Scientific and Eng.	-0.4	0.8	0.3	1.3	-0.3	-0.4	-1.2	0.1	-0.6	0.6	0.8	0.0	-0.3	-0.4	-0.7	0.2	0.9	-0.3	0.2	-0.0	-0.5	-0.1
Materiel and Compt.	-0.1	0.6	-0.4	0.9	-0.1	-0.4	-0.8	0.4	-0.3	0.1	0.5	-0.8	-0.1	-0.2	-0.3	0.0	1.0	-0.1	0.2	0.2	-0.1	-0.3
Professional	-0.1	1.2	0.1	1.0	1.1	-0.6	-1.2	0.0	-1.4	-0.8	1.5	-0.6	-0.0	-0.4	-0.5	0.5	0.6	-0.4	1.0	0.0	-1.0	-0.4
Admin. and Support	-0.4	-0.1	-0.2	1.7	0.1	0.1	-0.3	0.1	-0.6	0.3	0.7	-0.5	-0.3	-0.8	-0.3	0.0	0.3	-0.1	0.8	0.5	-0.7	-0.3

[a] Pilot and Navigator AFSCs: 10XX, 11XX, 12XX, 13XX, and 15XX, except omit 1515.

Air Operations AFSCs: 14XX, 1515, 16XX, 17XX, 18XX, and 19XX.

Scientific and Engineering AFSCs: 25XX, 26XX, 27XX, 28XX, 30XX, 31XX, 32XX, 43XX, 47XX, 55XX, and 57XX.

Materiel and Comptroller AFSCs: 60XX, 63XX, 64XX, 65XX, 67XX, 68XX, and 74XX.

Professional AFSCs: 88XX, 89XX, 90XX, 91XX, 92XX, 97XX, and 99XX.

Administrative and Support AFSCs: 02XX, 03XX, 23XX, 70XX, 73XX, 75XX, 79XX, 80XX, 81XX and 82XX.

[b] The values in this table were computed by taking the difference between the average of ratings assigned by a rater (on the 16 point scale) to jobs in a particular category from an average of ratings assigned by all raters to jobs in that category. Since three points on the 16-point scale represents one grade level, a value of 3.0 in Table 1 would indicate that a board member rated jobs in a given category approximately one grade higher than other board members. Similarly, a value of -3.0 would indicate judgments averaging approximately one grade lower than those of other members. The highest reported value is only 1.7, and most of the values are less than 1.0. The largest values tend to be associated with judges who rated all categories somewhat high or low, and these judges did not show a bias toward jobs in particular categories.

Table 3. Definition of Variables Included in Officer Grade Requirements Policy Equation

Variable Number	Variable Name	Variable Definition		Source of Data
1	Management	The level of executive and managerial skills required by the job. The complexity, variety and level of the activities which are directed, organized, coordinated, controlled, commanded, or evaluated.		Mean ratings for each job obtained from five field judges
2	Planning	The extent to which planning is required by the job. The scope and significance of work for which planning is done. The longer the time span for which planning is done, the higher the rating.		Mean of ratings for each job obtained from five field judges
3	Special Training and Work Experience	The extent to which the job requires knowledges and skills which must be acquired through special training courses or on-the-job experience. Does not include general courses given by Squadron Officer School, Air Command and Staff College, or Air War College.		Mean of ratings for each job obtained from five field judges
4	Judgment and Decision Making	The importance and independence of Judgments and decisions required by the job. The nature, variety, and possible impact of decisions. The less well defined the guidance for decisions, the higher the rating; while the more specific and detailed the guidance, the lower the rating.		Mean of ratings for each job obtained from five field judges
5	Communications Skills	The extent to which the job requires skill in oral and written communication as well as the level of the individuals and agencies involved.		Mean of ratings for each job obtained from five field judges
6	Level of Organization in Which Job Occurs	DOD or Hq USAF	= 9	Data from Job Description Form
		Hq Major Air Command	= 8	
		Numbered AF or equivalent	= 7	
		Air Division or equivalent	= 6	
		Wing or equivalent	= 5	
		Group or equivalent	= 4	
		Squadron or equivalent	= 3	
		Detachment or equivalent	= 2	
		Other	= 0	
7	Level of Job Within Organization	Command Element	= 7	Data from Job Description Form
		Directorate, Department, Office or equivalent	= 6	
		Division or equivalent	= 5	
		Branch or equivalent	= 4	
		Section or equivalent	= 3	
		Unit or equivalent	= 2	
		Other	= 0	
8	Field Grade Rating	Rating of appropriate grade for job using the 16-point OGR Grade Rating Scale.		Mean ratings for each job obtained from five field judges
9	Supervisor's Grade Rating	Supervisor's rating of appropriate grade for job using a 7-point scale.		Data from Job Description Form

After a satisfactory policy equation was developed, it was applied to determine the grade requirements for an additional 10,000 jobs. These results were projected to determine the appropriate distribution of grade for various specialties and specialty groupings (Christal, 1965).

With its implications on the establishment of Air Force officer grade requirements, the OGR study illustrates an important application of the policy-capturing model. In this study, the model permitted expression of the policy of a board in a definite and precise manner and definition of the meaning of grade to this board.

III. SUMMARY AND CONCLUSIONS

A model has been described for defining and implementing the policy of a rating board or an individual. The policy board is required to study relevant information and to prescribe the correct decisions or actions to be taken in a sample of situations. The multiple linear regression model is employed to identify the variables considered by the board, and to determine how these variables must be weighted to reproduce the board's actions. The resulting equation is called a policy equation. Application of the policy equation for subsequent decision making is called policy simulation, since the equation literally simulates the board.

Studies thusfar conducted indicate that policy boards are highly consistent in their judgments when the problem is well defined and when relevant information is available. Policy equations developed using the regression model have been very accurate. Equations are easiest to derive when data considered by the board are known and are already quantified. However, it is usually possible for an investigator to identify the appropriate variables when they are not defined. This is accomplished by a system of hypothesis testing. When case data are not available to the board, it is still possible to develop a policy equation, using cases which have been created by ascribing to them score values on relevant variables.

In the Air Force, boards are frequently convened to determine how variables should be weighted together for making decisions. Who shall be promoted? Who shall be returned to active flying status? Which specialties shall be given proficiency pay? Which officers shall be integrated into the regular Air Force? Who shall be retired? The solution of all such problems involves the weighting together of factors judged to be relevant for the achievement of agreed-upon goals. If these factors are made explicit, then the multiple linear regression analysis model can be applied to derive a precise statement of the factors and weights to be used in carrying out the board's recommendations.

Applications of the policy-capturing model described in this paper have been drawn primarily from the military setting. However, one can easily see how the model might be applied to study such diverse properties as the quality of beefstock, the beauty of pictures, the effectiveness of workers, the quality of English compositions, or the acceptability of applicants for a king's harem.

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Unclassified
Security Classification

DOCUMENT CONTROL DATA - R&D

(Security classification of title, body of abstract and indexing annotation must be entered when the overall report is classified)

1. ORIGINATING ACTIVITY (Corporate author)	2a. REPORT SECURITY CLASSIFICATION
Personnel Research Laboratory Lackland AFB, Texas 78236	2b. GROUP

3. REPORT TITLE

SELECTING A HAREM--AND OTHER APPLICATIONS OF THE POLICY-CAPTURING MODEL

4. DESCRIPTIVE NOTES *(Type of report and inclusive dates)*

5. AUTHOR(S) *(Last name, first name, initial)*

Christal, R.E.

6. REPORT DATE	7a. TOTAL NO. OF PAGES	7b. NO. OF REFS
March 1967	10	10

8a. CONTRACT OR GRANT NO.	9a. ORIGINATOR'S REPORT NUMBER(S)
b. PROJECT NO. 7734, 7719 c. Task 773402, 771901 d.	PRL-TR-67-1
	9b. OTHER REPORT NO(S) *(Any other numbers that may be assigned this report)*

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13. ABSTRACT

This paper describes how a mathematical equation, derived with the fixed-X multiple linear regression model, can be used to define and implement the policy of an individual or rating board. The model, which has been discussed in previous papers, is described in easy-to-follow, non-technical language. Several applications of the model are presented.

DD FORM 1 JAN 64 1473

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14. KEY WORDS	LINK A		LINK B		LINK C	
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job evaluation						
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